

Sandia researchers study methods for removing arsenic from drinking water to help meet new EPA standards

Ceremony in Anthony, N.M., marks start of research project with southern New Mexico utility

By Chris Burroughs



ARSENIC REMOVAL RESEARCH — Sandia researcher Alicia Aragon checks out arsenic removal tubing and equipment similar to what is being used in an Anthony, N.M., well test site. The research team, led by Malcolm Siegel, is seeking ways to develop cost-effective water treatment technologies. (Photo by Randy Montoya)

Over the next several months a team of Sandia researchers led by Malcolm Siegel (6118) will be studying different methods of arsenic removal at the Desert Sands Mutual Domestic Water Consumers Association (MDWCA) in Anthony in southern New Mexico.

A ceremony marking the start of the project was held Aug. 26 at the utility's main well site. On hand were representatives from Sandia, Sen. Pete Domenici's office, the New Mexico state legislature, and the water utility.

The arsenic research is sponsored by the Arsenic Water Technology Partnership. The partnership is a consortium of Sandia, the Awwa Research Foundation (AwwaRF), and WERC, a consortium for environmental education and technology development. Domenici secured the funding for the project through DOE as chairman of the Senate Energy and Water Development Appropriations Subcommittee.

MOU signing

At the Aug. 26 ceremony Sandia and the MDWCA signed a memorandum of understanding (MOU) to begin the research.

Signing for Sandia was John Merson, deputy director for Geoscience & Environment Center 6100. The utility representative was Rosaura

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Sandia fights workplace violence with new policy, online courses

By Chris Burroughs

Each year from 1993 through 1999 an average of 1.7 million people were victims of a violent crime while working or on duty in the US, according to a report published by the Bureau of Justice Statistics. An estimated 1.3 million (75 percent) of these incidents were simple assaults, while an additional 19 percent were aggravated assaults.

For the same time period, more than 800 workplace homicides per year were recorded by the Bureau of Labor Statistics' Census of Fatal Occupational Injuries.

Sandia does not want to be part of these staggering statistics and is continuing to take active measures to ensure such types of workplace violence doesn't happen here.

Sandia has a Workplace Violence Prevention Program under the leadership of Dr. Larry Clevenger, director of Health, Benefits, and Employee Services Center 3300. He is expected to transfer the workplace violence responsibilities to a new head soon. The task includes heading up Sandia/New Mexico's Threat Assessment Team, which reviews and makes recommendations on individual workplace violence cases.

In April a seven-year-old policy that pledged zero tolerance for workplace violence was updated to provide new contact information, a new description of prohibited behavior, and to

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Disintegrating asteroid's dust monitored for first time; Sandia optical sensors contributed

Meteoroid dust particles larger than thought, could affect weather

By Neal Singer

The object — a little less than 10 meters across — entered Earth's atmosphere on Sept. 3, 2004, traveling at 13 kilometers per second.

The space-based infrared sensors of the US Department of Defense detected it at an altitude of 75 kilometers, descending off the coast of Antarctica.

DOE visible-light sensors built by Sandia noticed the intruder when it became a fireball — thus identifying itself as an asteroid — at approximately 56 kilometers above Earth.

Five infrasound stations, built to detect nuclear explosions anywhere in the world, registered its acoustic waves; these were analyzed by researchers at Los Alamos National Laboratory.

NASA's multispectral polar orbiting sensor imaged the debris cloud formed by the disintegrating space rock.

It was one of the largest meteoroids to have entered the Earth's atmosphere in the past decade. (Later analysis showed that its original

solar orbit is similar to that of near-Earth asteroids of a particular family, the Aten group.)

Some 7.5 hours after the initial observation, a cloud of anomalous material was detected in the upper stratosphere over Davis Station in Antarctica by ground-based lidar.

These were the first direct measurements ever made of such meteoritic "smoke."

"We noticed something unusual in the data," says Andrew Klekociuk, a research scientist at the Australian Antarctic Division. "We'd never seen anything like this before, [a cloud that] sits vertically and things blow through it. It had a wispy nature, with thin layers separated by a few kilometers. Clouds are more consistent and last longer. This one blew through in about an hour."

There was certainly something unusual about the cloud. It was too high for ordinary water-bearing clouds (32 kilometers instead of 20 km) and too warm to consist of known manmade pollutants (55 degrees warmer than the highest

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12 Exercise physiologist answers questions on back injuries

What's what

I don't know if this is a good habit or a bad habit, but I think most of us have it: We all have a drawer where we collect "stuff." You know: paper clips, rubber bands, thumb tacks, landscapers' business cards, unconsummated shopping lists, take-out menus, Wal-Mart receipts, etc., etc. You know – the detritus of the day.

The immutability of having such a drawer is probably defined somewhere as "Somebody's" Law (you know, like Murphy's Law) and there's probably "somebody else's" corollary that says whatever you're looking for won't be in that drawer, no matter how big the drawer is or how much stuff is in it. And that applies to "stuff" drawers at work as well as at home.

For example, a recent lunchtime search for a plastic knife turned up nothing. In the drawers of the two kitchenette areas in our building, there's enough salt to preserve a day's catch of cod, enough pepper to send the entire lab population into a sneezing fit, and a collection of plastic forks and spoons from every fast-food place this side of the Pecos. There's sugar and all of its artificial sweetener cousins, tattered paper napkins, a dull can opener or two, and lots of other "stuff." But no knives.

Maybe I'm missing something, but if these things are bought in equal quantities, why don't we run out of forks and/or spoons before knives? Probably "yet somebody else's" corollary.

* * *

The *Lab News* provides a lot of service to readers. It keeps up with promotions and retirements and milestones, research developments, births, reorganizations, and other events that make up life at Sandia. As the last issue before this one was being put together, someone noted also the service provided by the classified ads.

A couple starting with nothing else could set up a household by shopping the ads, it was pointed out. You can find furniture, appliances, cars, property, houses, tools – a little of everything. And what prompted that observation?

The last issue even included a couple of wedding dresses.

* * *

Our group OAA Michelle Fleming, who cleverly brought in a little three-drawer keeper for plastic flatware (didn't work for the knives, obviously, see above), equally cleverly hung a pair of fuzzy dice in our group cart to differentiate it from the unadorned carts of less imaginative groups.

That hasn't worked either, so far. Both cart and fuzzy dice remain missing. If you know anything about this, call Michelle at 844-4902. She wants the cart back. Probably the fuzzy dice, too.

* * *

And on the origin of the word "golf," Laurie Bergeron (5924) e-mailed "the real skinny from the British Golf Museum.

"The medieval Dutch word 'kolf' or 'kolve' meant 'club.' It is believed that word passed to the Scots, whose old Scots dialect transformed the word into 'golfe,' 'gowl' or 'gouf.'

"By the 16th century, the word 'golf' had emerged.

"Sources: British Golf Museum, USGA Library."

– Howard Kercheval (844-7842, MS 0165, hckerch@sandia.gov)

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Retirees (only):

To notify of changes in address, contact Carol Wade, Benefits Dept. 3332, at 505-845-9705, e-mail cawade@sandia.gov, or Mail Stop 1021, Sandia National Laboratories, Albuquerque, NM 87185-1021.

Others:

To receive the *Lab News* or to change the address (except retirees), contact Michelle Fleming, Media Relations and Communications Dept. 3651, 505-844-4902, e-mail meflemi@sandia.gov, or Mail Stop 0165, Sandia National Laboratories, Albuquerque, NM 87185-0165.

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To change the number of copies of the *Lab News* your Mail Stop is receiving please call Honario Anaya, Mail Services Team 10268-4, at 844-3796. At Sandia/California contact the Mail Room at 294-2427.

Web Users:

The *Lab News* is on the Web at www.sandia.gov/LabNews.

New guidelines developed for linking from top-level sandia.gov pages

As part of ongoing efforts to create a consistent look for Sandia's external website, new guidelines have been established for pages linking from the top levels of www.sandia.gov.

The guidelines require that web sites and pages developed after Sept. 15 use the 2005 "blue banner" template if they are, or desire to be, linked from sites listed on the site map (accessible from the top right corner of sandia.gov). By using the template, web developers can ensure that their pages contain fonts, a navigation structure, and overall look that is consistent with Sandia's home page and pages at the next level.

The template, developed by WebCo (4527) and the Public Relations & Communications Center (3600), can be found in Sandia's External Web Publishing Guidelines (www-irn.sandia.gov/ewpg/templates).

"The goal of the template and these guidelines is to provide visitors with visual continuity as they navigate Sandia's web site and to enhance its usability," said Media Relations manager Chris Miller (3651). "If web pages deviate significantly from our established 'look,' it can create confusion for visitors, who may think they have left Sandia's site."

Existing web pages will not be required to use the new template but are strongly encouraged to do so. However, they must still have a professional appearance and meet the following DOE and Sandia requirements:

- Display the official Sandia logo
- Link to the Privacy and Security page
- Provide an e-mail link to the site owner
- Include Sandia's meta tags
- Use no "persistent cookies"
- Contain appropriate content
- Be approved through the formal Review and Approval process

In October, an "advanced" version of the template will become available, offering greater navigation and coding flexibility to web developers who are comfortable using cascading style sheets and server-side include technology. For questions on the linking guidelines, contact Kara Madden (844-9413) or Julie Hall (284-7761).

Recent Patents

Steve Eisenbies (8221) and Steve Haney (8245): System and Method for Reproducibly Mounting an Optical Element.

Frances Wyant (6861), Steven Nowlen (6861), and Spencer Luker (1384): Automatic Insulation Resistance Testing Apparatus Allows Combined Cable Fire Testing.

Steve Goods (8754), Nancy Yang (8773), and Chuck Cadden (8243): Process for the Electrodeposition of Low Stress Nickel-Manganese Alloys.

Ana Martinez (5354), Douglas Bickel (5354), and Armin Doerry (5342): Two Antenna, Two Pass Interferometric Synthetic Aperture Radar.

Mark Ackermann (5928): Ring Laser Scatterometer.

Barry Spletzer (6600), George Davidson (1400), Daniel Zimmerer (5334), and Lisa Marron (6634): Fractional Screen Video Enhancement Apparatus.

Paul Dentinger (8764): Photoresist Substrate Having Robust Adhesion.

David Haaland (8332) and David Melgaard (1812): Augmented Classical Least Squares Multivariate Spectral Analysis.

John Klem (1742): Distributed Bragg Reflectors with Reduced Optical Absorption.

Kent Choquette and John Klem (1742): Long Wavelength Vertical Cavity Surface Emitting Laser.



Congratulations

To Ed Mignardot (6146) and Robin Napoleone, married in Santa Fe, July 23.

To Janet Carpenter (3651) and Kirk Westfall, married in Albuquerque, Aug. 1

Physical & Engineering Sciences Center 8700's new director returns to his materials science roots

By Nancy Garcia

In a way, Bob Carling's promotion to director of Physical & Engineering Sciences Center 8700 is a return to his roots in materials science. Bob began working at Sandia in 1976 after receiving a doctorate in physical chemistry from the University of Michigan. He was promoted from senior manager in 8350 to succeed Jill Hruby, who is now director of Homeland Security Systems and Development Center 8100.

Bob's first 10 years in materials science were interrupted by a couple of other assignments. He worked in the solar energy program for two years, studying molten salts and other energy storage systems. He also spent six months on the Excalibur X-ray laser program definition study in 1983 (part of the Strategic Defense Initiative for which the Micro and Nano Technologies Laboratory building, where he has his new office, was built).

He was then promoted to supervisor in the materials area, taking over the exploratory chemistry department. The researchers pursued projects ranging from investigating contaminants in weapon components, modeling the fate of mineral residue from coal combustion, to optimizing plating operations for weapon systems and providing analytical chemistry services.

In 1986, Bob moved to the Combustion



BOB CARLING

Photo by Daniel Strong

Research Facility (CRF) assuming management responsibility for a DOE/DoD program on energetic materials. In 1991, he took over the engine combustion department, which he managed for about a decade.

The Partnership for a New Generation of Vehicles (PNGV), an initiative between DOE and the US Council for Automotive Research (a consortium of Ford, GM, and DaimlerChrysler), began in 1993 and provided a forum for renewed interest in improving combustion efficiency and reducing pollutants.

During this period Bob worked closely with the other national laboratories to formulate plans to support PNGV. The CRF's engine labs enjoyed an increase in support through that program, in addition to the new space made possible in the CRF Phase II expansion of labs and office areas

tion he and his wife Sue, a teacher at Marilyn Avenue School in Livermore, attended at then-Vice President Al Gore's house along with about 50 other guests who were honored for contributions to PNGV.

More recently as the 8350 senior manager, Bob's primary responsibility has been the BES-funded chemical sciences and visitor program at the CRF as well as the microfluidics and remote sensing work in 8300. The chemical sciences program is viewed as world-class with several new discoveries recently making the pages of *Science*. One of the Center 8300 research areas that emerged during his tenure, and has shown great promise, is the growing effort to develop fiber lasers. Currently funded as a Laboratory Directed Research and Development Grand Challenge, Bob predicts this will become an enabling tech-

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through support from the DOE's Office of Basic Energy Sciences (BES).

As a manager developing partnerships with industry, he would explain to auto industry representatives the niche of a national lab, in which teams of disparate talents pull together to work the hardest problems to benefit the nation. Bob was also the first national laboratory researcher on-loan to an automaker, spending 10 months at Ford's Scientific Research Lab in Dearborn, Mich., in 1994-95.

"PNGV was an exciting, challenging program," Bob recalls. Equally enjoyable was a recep-

nology with application to many Sandia programs, much like MicroChemLab, the Laboratories' first grand challenge.

"Research organizations ought to be working on the science that will lead to the next set of tools and techniques," Bob says, pointing to other successes, such as a suite of remote sensing work, the Extreme Ultraviolet Lithography project, and microfabrication expertise in LIGA.

Although it is too soon to articulate a precise vision for Center 8700, Bob says his outlook is that "science and technology meeting the needs of tomorrow" will be a theme.

Feedback

Readers ask questions about ticketing parking violators, Spot awards, Sandia-designated ID numbers

Q: Has anything changed regarding the ticketing of parking violators? Last I read, a new policy to ticket offenders was in the works. I quote from a previous Feedback response, "However, we are working with the Protective Force to come up with a ticketing process that has 'teeth' so that tickets can be enforced and we can minimize the abuse that is currently taking place. We are in the final stages of completing this process."

I work second shift and although there are four clearly marked '2nd shift' parking spaces in the lot southwest of JCEL, there are always unauthorized vehicles parked in the spaces. I leave copies of our parking policy on the windshields of these vehicles, but the same people are back again and again with no regard to rules or fairness. When will the new parking policy take effect?

A: As stated in the last Feedback concerning this matter, we are in the process of getting the document signed off by upper management. The schedule for implementation of the program is as follows: 1) Sept. 1 — implementation of a data-gathering and burn-in phase, 2) Oct. 1 — Full implementation of the process, with disciplinary actions associated with the violation. We know that this has been a long and painstaking process, but we wanted to fix the problem, not just place a band-aid on it. Thank you for your concern. Hopefully this will take care of the people who are continuously violating and taking advantage of the parking situation.

— Darrell Fong, Chairman, the Sandia Traffic Safety Committee

Q: Is Spot, as in Spot award, an acronym for something? How did the word become associated with a nonbase award? You'd think it would be called Individual Performance Award (IPA) or something with a significant meaning.

A: Spot, as in spot award, is not an acronym. The term infers to paying an unscheduled bonus "on the spot" to show appreciation to an employee for "going above and beyond" their normal job for the good of the company and/or for a "job well done."

Two forms of spot awards used at Sandia are the Special Recognition Award (SRA) and the Sandia Award for Excellence (SAFE). The SRA is a lump-sum cash award given to recognize significant short-term efforts such as meeting project milestones. The SAFE is a lump-sum cash award accompanied by formal certificates. SAFEs are given to recognize significant accomplishments with broad impact, such as completing major projects (usually spanning departments and/or centers).

Sandia also utilizes Individual Performance Awards (IPAs). They may be given once a year as a part of the compensation review cycle. The IPA is a lump sum cash award given to individuals as part of the compensation review to recognize and reward current-year achievements. IPAs may be used in combination with base compensation or without a base compensation increase to appropriately place the employee on a total cash compensation basis with their value of contribution.

— BJ Jones (3500)

Q: I heard that Sandia is now transitioning from using social security numbers to using Sandia-designated identification numbers for its employees, which will definitely assist in protecting employees' personal information. On Sandia's directory, the identification number for each employee is listed. Will this number be our new employee ID number? If so why is it listed on the directory for public display, especially if there is a possibility that third-party administrators are eventually going to use this number? I believe that only the employee and those with a business need should know an employee's ID number.

A: You are correct in that your new Sandia ID can be viewed on the top right-hand corner of your directory page. The Sandia ID is not and should not be considered confidential and access to them will not be controlled any more than it would be for your name. There is a policy in the works that the Sandia ID number may never be used for access to something requiring controls without a secondary authentication key of some sort. Think of the Sandia ID as you would your computer User ID. The computer User ID is open to all and used, as a part of the e-mail address, but a password is required for access. We would expect that all systems and third party administrators would use the Sandia ID and require authentication. For the reasons above there will be no constraint of need to know placed on Sandia IDs. We purposely do not want to create an ID that if obtained by itself could compromise access.

— BJ Jones (3500)

Asteroid

(Continued from page 1)

expected frost point of human-released solid cloud constituents). The cloud could, of course, have been made of dust from a solid rocket launch, but the asteroid's descent and the progress of its resultant cloud had been too well observed and charted; the pedigree, so to speak, of the cloud was clear.

What was really unusual about the cloud was the size of its particles. Computer simulations agreed with sensor data that the particles' mass, shape, and behavior identified them as asteroid constituents roughly 10 to 20 microns in size.

Micron-sized particles are big enough to reflect sunlight, cause local cooling, and play a major role in cloud formation.

Scientists formerly had paid little attention to dust from meteoroids, assuming that the burnt matter disintegrated into nanometer-sized particles that did not affect Earth's environment. Some researchers (and science fiction writers) were more interested in the damage that could be caused by the intact portion of a large asteroid striking Earth.

"Our observations suggest that [meteoroids exploding] in Earth's atmosphere could play a more important role in climate than previously recognized," write Klekociuk and other researchers, including Sandia's Dick Spalding (5740), in a paper published last week in the journal *Nature* (Aug. 25 issue).

Klekociuk, along with researchers from the University of Western Ontario, the Aerospace Corp., LANL, and Sandia had found evidence that dust from the asteroid burning up as it descended through Earth's atmosphere formed a cloud of micron-sized particles significant enough to influence local weather in Antarctica.

Volcanic eruptions from the sky

Says Dee Pack of Aerospace, "This asteroid deposited 1,000 metric tons in the stratosphere in a few seconds, a sizable perturbation." Every year, he says, 50 to 60 meter-sized asteroids hit Earth.

Micron-sized meteoroid dust could be a factor in climate simulations because meteoroids entering Earth's atmosphere are extremely reduced by the fireball caused by the friction of their passage. The solid mass reduced to dust may be as much as 90 to 99 percent of the original asteroid.

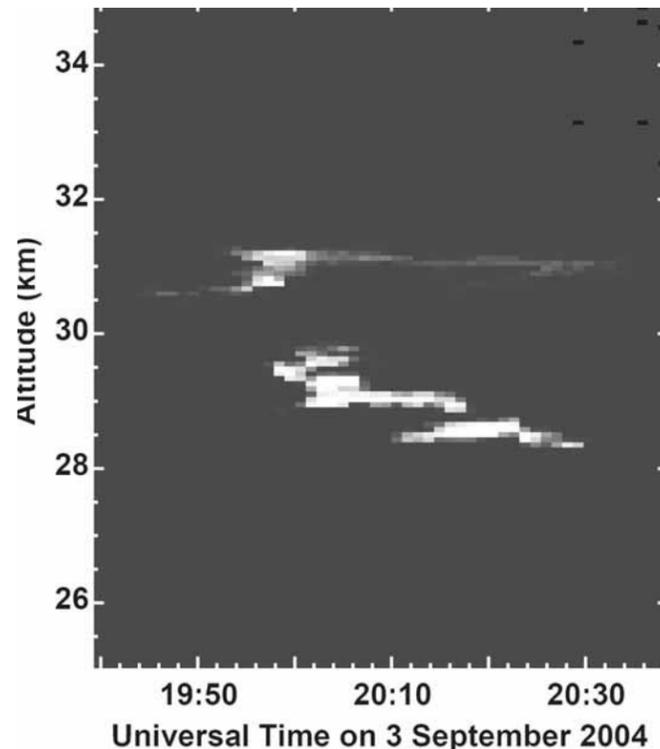
Peter Brown at the University of Western Ontario, initially contacted by Klekociuk, helped analyze data and did theoretical modeling. He points out that climate modelers might have to extrapolate from this one event to its larger implications.

"[Meteoroid dust could be modeled as] the equivalent of volcanic eruptions of dust, with atmospheric deposition from above rather than below," he says. The new data on micron-sized particles "has much greater implications for [extraterrestrial visitors] like Tunguska." He was referring to an asteroid or comet that exploded 8 kilometers above the Stony Tunguska River in Siberia in 1908. About 2,150 square kilometers were devastated, but little formal analysis was done on the atmospheric effect of the dust that must have been deposited in the atmosphere.

Preventing nuclear war

The capabilities of defense-related sensors to distinguish between the explosion of a nuclear bomb and an asteroid fireball that releases similar amounts of energy — in this case, about 13 kilotons — could provide an additional margin of world safety. Without that information, a country that experienced a high-energy asteroid burst that penetrated the atmosphere more deeply might lead a hair-trigger military response unit to believe either that its country has been attacked or that a nearby country is testing a nuclear weapon.

The Sandia sensors' primary function is to observe nuclear explosions anywhere on Earth. Their evolution to include meteor fireball observations came when Dick Spalding recognized that ground-based processing of data might be modified to record the relatively slower flashes



ASTEROID DUST — Asteroid's dust cloud detected from light detection and ranging (lidar) instrument at Davis station, Antarctica. The paper's authors say this is the first unambiguous detection of lidar backscatter from the dust trail of a large meteoroid. Other instruments, including DOE visible-light sensors created by Sandia, also monitored the asteroid's disintegration in Earth's atmosphere.

due to asteroids and meteoroids. Sandia computer programmer Joe Chavez (5724) wrote the program that filtered out signal noise caused by variations in sunlight, satellite rotation, and changes in cloud cover to realize the additional capability. The Sandia data constituted a basis for the energy and mass estimate of the asteroid, says Dick.

Longer research papers being prepared from the same data for other journals are expected to discuss possible negative effects on the planet's ozone layer, says Pack.

Violence

(Continued from page 1)

clarify processes (Corporate Process Requirement (CPR300.5.4) titled Workplace Violence Prevention Program, <http://www-irn.sandia.gov/policy/people/medical/cprviol.htm>). In addition to these items, the CPR provides guidance in identifying and addressing workplace violence concerns and clarifies employee and management roles and responsibilities as well as the responsibilities of Sandia's Threat Assessment Team.

Workplace violence serious matter

"We take workplace violence very seriously at Sandia," Larry says. "We want an environment where people feel safe, valued, and free to report any problems to the appropriate authorities."



THIS IS AN IMAGE from the web-based workplace violence mandatory course that managers are taking this month.

Help numbers to call

During operational hours, to report emergencies regarding threatening or violent behavior at work, dial 911. During nonoperational hours, employees should call 311. In Livermore, call 911 for emergencies and 294-2300 for nonemergencies.

The new policy goes farther than just saying that workplace violence is not tolerated at the Labs. It explains in simple terms prohibited conduct, ways to report threats, and helps managers and employees know when they should turn to Human Resources, Employee and Labor Relations, Emergency Management, and others for help.

Lockheed Martin only recently began requiring its companies to put in place workplace violence policies in light of the terrible 2003 tragedy at its Meridian, Ga., plant where a Lockheed Martin worker shot and killed five people and wounded eight others before killing himself.

"Sandia is in a strong position to meet the new Lockheed Martin requirement because of the existing workplace violence program initially established in 1998," says Diane Nakos (3011), tasked with developing the new Workplace Violence Prevention Program.

Mandatory online courses

As part of the effort to make Sandia employees aware of how to prevent workplace violence, a series of mandatory online courses will be delivered. The Lockheed Martin-developed courses will include Sandia-specific contact information to help employees and managers address concerns.

The first course, "Managing Troubled Employees," became available Monday and is for

managers only. A second course for managers, "Managing Troubling Situations," is anticipated for release later this year. Also later this year, online workplace violence training will be required for the general employee population.

"Managing Troubled Employees" takes 30 to 60 minutes to complete and offers managers information about how to spot a troubled employee, what to do when you recognize one, and where to turn for help.

Bob Stevens, Lockheed Martin president and CEO, expresses commitment to the prevention of workplace violence and says as part of the course, "The bottom line is you are not alone. Everyone has an important role to play in preventing workplace violence."

A troubled employee is described in the first managers' course as one whose "performance or workplace behavior is unacceptable, dysfunctional, overly controlling, or in other ways unusual or inappropriate." Guidance to managers is that their main task is not to diagnose the cause of inappropriate or troubling behavior but to observe changes in performance and seek guidance from appropriate resources.

More information about Sandia's workplace violence prevention program can be obtained by contacting John McAuliffe (3011) at 844-9260, Larry Clevenger (3300) at 845-8037, Robert Petro (8527) at 294-2565, or Diane Nakos at dgnakos@sandia.gov or 844-9434.

More information

More information about workplace violence can be found at the Centers for Disease Control website: <http://www.cdc.gov/niosh/injury/tramaviolence.html>

Sandia, task force to study ways ocean and wastewater can be desalinized in California

Sandia researchers, together with fellow members of the Joint Water Reuse & Desalination Task Force, in coming months will be studying the best ways for how ocean water, subsurface brines, and wastewater can be desalinized and made potable.

The California Department of Water Resources recently granted Sandia and its task force partners \$1 million for the study. The task force — which consists of Sandia, the WaterReuse Foundation, the Bureau of Reclamation, and the American Water Works Association Research Foundation — matched the award for a total of \$2 million. Each member

has to contribute \$250,000 to the project.

“Over the next six months we will decide on the type of research we will do in the California effort,” says Pat Brady (6118), who heads up the project for Sandia.

Among possibilities to be studied will be alternatives to dispose waste — extremely salty water — after the desalination process. The waste could be dumped into the ocean, put in ponds for evaporation, or injected into the subsurface.

Pat notes that California is growing rapidly and may have limited choices about where to obtain future water supplies.

“They may have to come from the ocean or municipal wastewater,” he says.

Sen. Pete Domenici, R-N.M., who secured more than \$4 million for desalination efforts for Sandia as chairman of the Senate Energy and Water development Appropriation Subcommittee, says this type of research could be the “long-term solution to our nation’s and New Mexico’s water problems.

“This award for research is an excellent step in the right direction,” he says. “California shares many of our state’s water problems, so technology developed under this award will be of benefit to everyone.” — *Chris Burroughs*

Arsenic

(Continued from page 1)

Pargas, president.

“The Desert Sands project will supplement a full-scale demonstration by the US EPA [Environmental Protection Agency] for evaluation of a removal technology that uses granular iron oxide to filter arsenic from water,” Malcolm says. “As water is pumped through the system, arsenic sticks to the iron oxide. The Desert Sands MDWCA wants Sandia to compare the performance of the [iron oxide] material they are currently using to other adsorptive media. We should be able to give them some practical advice based on what we learn.”

Best adsorptive material

The Sandia field team includes lead engineer Malynda Aragon and field technicians Randy Everett and William Holub (all 6118). Malynda anticipates they will test between eight and 12 different arsenic removal systems at the Anthony site. “We’ll be looking at which material best adsorbs arsenic to compare how often the adsorptive media needs to be changed,” she says.

The treatment system, including plastic columns filled with adsorptive material and monitoring equipment, was built at Sandia and was recently relocated to the Desert Sands utility.

Desert Sands serves a population of 1,535 from two wells in a rural community along the New Mexico-Texas state line, north of El Paso. It has a new water treatment plant built by Severn Trent Corp. that uses the iron oxide treatment method.

The Anthony research is a follow-up to work in Socorro, N.M., where the Sandia team

tested five arsenic removal technologies at a geothermal spring. The pilot test in Socorro compared five innovative technologies. These treatment processes were chosen from more than 20 candidate technologies that were reviewed by teams of technical experts at Arsenic Treatment Technology Vendor Forums organized by Sandia and held at the 2003 and 2004 New Mexico Environmental Health Conferences.

Congressional support and design of the Arsenic Water Technology Partnership was developed under Domenici’s leadership to help small communities comply with the new EPA drinking water standard for arsenic. The new regulation, which goes into effect in January 2006, reduces the maximum contaminant level (MCL) from 50 micrograms per liter ($\mu\text{g/L}$) to 10 $\mu\text{g/L}$ and is intended to reduce the incidence of bladder and lung cancers caused by exposure to arsenic.

Arsenic levels high in west

Levels of naturally occurring arsenic in the southwestern US often exceed the new MCL. The new compliance requirements will affect small communities that lack the appropriate treatment infrastructure and funding to reduce arsenic to newly required levels.

Malcolm says the goals of the program are to “develop, demonstrate, and disseminate information about cost-effective water treatment technologies in order to help Native Americans and small communities in the Southwest and other parts of the country comply with the new EPA standard.”

Besides the Socorro and Desert Sands experiments, additional demonstrations, based on technologies reviewed at vendor forums and developed by DOE labs or in laboratory studies managed by AwwaRF, are also being considered in consultation with the New Mexico Environment Department, the EPA, the Indian Health Service, the Navajo Nation EPA, and the Interstate Technology Regulatory Council.

WERC, a consortium of research institu-



MALCOLM SIEGEL is the arsenic project lead, and Malynda Aragon is the lead engineer. Malynda anticipates they will test between eight and 12 different arsenic removal systems at the Anthony site.

tions in New Mexico, will evaluate the economic feasibility of the technologies, work on technology transfer activities, and conduct educational outreach.

Whether a current proposal to phase in stricter arsenic requirements over years takes hold or not, there will still be a need to help communities modify systems to perform better, Malcolm says. Scientists are also beginning to look at other contaminants that may be regulated in the future.

“We need to stay ahead of the curve so communities can invest in proven systems that will address multiple contaminants,” he says.

Arsenic removal team

Sandia’s arsenic research treatment team includes Tom Hinkebein, Malcolm Siegel, Malynda Aragon, Randy Everett, William Holub Jr., Alicia Aragon, Brian Dwyer, Justin Marbury, Michelle Shedd, Emily Wright, Sandhya Rajan (all 6118), Carolyn Kirby (6116), Paul McConnell (6143), Jerome Wright (6115), Phil Pohl (6116), Hongting Zhao (6874), and students Nik Rael (6118), Melody Nocon, Andres Sanchez (6118), Katherine North, David Stromberg (6118), and Janelle Penisten (6143).



MOU SIGNING — John Merson, deputy director for Geoscience & Environment Center 6100, and Rosaura Pargas, president of the Desert Sands Mutual Domestic Water Consumers Association, sign an MOU Aug. 27 allowing Sandia to begin arsenic research at the well site in Anthony, N.M.

Eight individuals, 14 teams earn NNSA Defense Programs Awards of Excellence

David Beutler

David Beutler is being recognized for leadership in supporting design and test for qualification of the W76-1 in hostile radiation environments. He has made numerous creative recommendations in radiation hardness design and the utilization of above-ground test facilities. His leadership in test planning and coordination was pivotal in assuring that these tests were productive and accomplished as planned. In addition to helping the arming and fusing subsystem project advance towards its final qualification goal, Dave has been instrumental in establishing system-level requirements for the W76-1.



DAVID BEUTLER

Jerome Cap

Jerome Cap is being recognized for leadership and contributions in the area of Environments Engineering to Defense Programs. Jerry has become the recognized expert in mechanical environments and testing to gather those environments. Moreover, his expertise is applied directly to understanding component response and the qualification of components. Jerry has contributed to every major modern weapon system either at the system or component level — particularly with neutron generators and common radar components. Notable recent contributions include those to the B61 Alt 357 and the W80 Life Extension Program.



JEROME CAP

Kenneth Condreva

Kenneth Condreva is being recognized for enduring technical contributions and leadership to Sandia's Joint Test Assembly (JTA) instrumentation program. Ken successfully led a multi-organizational team in the JTA productivity pilot study and a team of engineers in developing a conceptual architecture for the Built-in-JTA program. The JTA productivity study was initiated by the Nuclear Weapons Strategic Management Unit Planning and Operations Office in order to evaluate and offer suggestions on improving the JTA development process. Under Ken's leadership, his team was able to develop a comprehensive model of the JTA development and reach conclusions on the driving cost and schedule factors.



KEN CONDREVA

Dan Curry

Dan Curry is being recognized for the outstanding production of a documentary on US Strategic Nuclear Policy, which tells an oral history beginning with the Manhattan project, through decades of changing administrations, to the present. During the multi-year production effort, Dan developed a comprehensive body of knowledge by interviewing over 40 key persons who helped create, implement, and/or advocate or oppose national nuclear policy. In addition, Dan conducted extensive archival research of the classified and unclassified policy documents and historical footage related to corresponding world events.



DAN CURRY

Active Ceramics Production Team

The Active Ceramics Production Team is being recognized for implementing major improvements and production efficiencies for the MC4380A Neutron Generator. Coupled with a Lean/Six Sigma effort, significant efficiency gains were also achieved through the increased experience and skill level of the active ceramics floor personnel. In addition to embracing Lean/Six Sigma methodology within department activities, employees have initiated the adoption of this continuous process improvement methodology within other 14100 organizations.

Team leader: Ronnie Stone. Team members: Harold Anderson, Jr., Marion Armijo, George Burns, Nelson Capitan, Johnny Casias, Jr., Linda Chappelle, Phyllis Chavez, Tom Chavez, Rita Coslow, Christopher Diantonio, Randolph Dillard, Audrey Gallegos, Robert Gallegos, Timothy Gardner, David Goy, Joannetta Hanlon, Ray Hannah, Erik Hart, Miriam Hilborn, Michael Hutchinson, Souvanny Kuthakun, Christopher La Pierre, Steven Lockwood, Warren Lubin, Julie Marquez, Ted Montoya, Roger Moore, Johnny Moya, Jay Newquist, Thomas Pehr, Brenda Pentecost, Mark Perea, Johnny Rice, Michael Romero, Andrew Sanchez, Margaret Sanchez, David Schroeder, Thomas Spindle, Sr., Angel Vega-Prue, Chad Watson, Pin Yang



Active Ceramics Production Team

Energetic Materials Reaction Processes Team

The Energetic Materials Reaction Processes Team is recognized for developing methods to understand how reaction processes in energetic materials affect nuclear weapon surety. Two major advances were: (1) the development of a new reaction modeling and chemical kinetics compiler and analysis tool that is used to develop mathematical models from simultaneous thermogravimetric modulated beam mass spectrometry data; and (2) the successful design and testing of the new chemical imaging precision mass analyzer.

Team leader: Richard Behrens, Jr. Team members: Robert Bastasz, Aaron Highley, Sean Maharrey, Josh Whaley, Denelle Wiese-Smith

Gel Impregnated Mylar Capacitor Development Team

The Gel Impregnated Mylar Capacitor Development Team is being recognized for successfully creating an impregnant based Mylar capacitor that meets all requirements. The gel-Mylar capacitor technology is a critical nuclear safety feature required for the weapons because it provides a weak link capability. This team determined the appropriate electrical, mechanical, and adhesive properties required from the gel to provide functional capacitive discharge units (CDUs). The gel-Mylar capacitor technology provides a big jump in the capability of main and auxiliary CDUs.

Team leader: John McBrayer. Team members: Robert Baron, Lothar Bieg, Scott Campin, Phillip Cole, Virginia De Marquis, Joseph Lenhart, Adam Lester, Kanamu Pupuhi, David Roesch, Ronald Sanchez, Duane Schneider, John Schroeder, Catherine Sobczak, Dana Thomas, Sean Winters

Materials WISDM (Weapons Information System & Data Management) Team

The Materials WISDM Team is being recognized for developing a collaborative environment for nuclear weapon test data and material model knowledge based assets. This innovative software application provides basic materials information and functionalities as well as advanced tools for experimentalists, analysts, constitutive material modelers, and designers. The Nuclear Weapons Complex and industry are switching from large-scale system tests to smaller material tests that are the basis for less expensive computational simulations. This fundamental change has increased pressures to document, store, and share any work associated with experimentation and analysis.



Materials WISDM (Weapons Information System & Data Management) Team

Team leader: Colby Lavin. Team members: Michael Bencoe, Winston Chou, Nathan Dautenhahn, Donna Djordjevic, Kenneth Downes, Binh Duong, Dennis Finch, Marcus Gibson, Edward Hoffman, Judy Jones, Robin Keeney-Southward, Christopher Lamb, Stephen Letourneau, Harold Morgan, Michael Neilsen, John Pott, Thomas Pucik, Max Schneider, William Scherzinger, Edward Walsh, Peter Wilson

Neutron Generator Kaizen Weld Team

The Neutron Generator Kaizen Weld Team is being recognized for developing the Simply MisVis methodology to rapidly improve production processes by incorporating mistake-proofing, visual instruction, and lean manufacturing principles. Simply MisVis consists of a single page process map, which guides a collaborative cross-functional team through a two-phase Kaizen (rapid improvement) event. The team refined and exercised the Simply MisVis process by applying it to several neutron generator welding processes, which reduced complexity and potential mistakes and resulted in less rework.

Team leader: Gary Pressly. Team members: George Coleman, Albino Garcia, Pierrette Gorman, John Lopez, Rosalie Lopez-Spinello, Kevin McBride, Michael Morgan, Elsi Rodriguez, Curt Tenorio, Douglas White

Nuclear Weapons Computing Cluster Team

The Nuclear Weapons Computing Cluster Team is being recognized for outstanding leadership during the procurement

Jennifer Gilbride

Jennifer Gilbride is being recognized for passionate commitment in developing modeling and simulation tools for structural dynamics assessments of the W88 reentry body systems that provide insight into the current stockpile and a critical foundation for a life extension program. Jenny has been an exceptional leader in the W88 program and has provided broad support to a number of the Navy nuclear weapons programs. Her strong leadership has earned her the highest level of respect from the Navy SPO, and she maintains an excellent relationship with the Navy personnel in these programs.



JENNIFER GILBRIDE

Scott Gillespie

Scott Gillespie is being recognized for outstanding work ethics and dedication for his requirements mapping efforts on the W78 neutron generator project. Scott has expanded the requirements mapping activity to include two other similar weapon systems. He compared W78 neutron generator requirements with those of the W76-0 and W76-1 to ensure consistency. As a result, several inconsistencies were found that required resolution. His work in this area has raised confidence across the three weapon systems that there are no requirements that are being overlooked or omitted.



SCOTT GILLESPIE

Anthony Gomez

Anthony Gomez is being recognized for his dedication and technical excellence in performing structural dynamics experiments critical to model validation and qualification of Sandia's weapons system products. Anthony has consistently demonstrated his ability to independently design, install, trouble-shoot, and operate complex instrumentation systems, evident by his current work on the W76-1/Mk4A program. His intimate knowledge of instrumentation systems and computerized data acquisition platforms has been essential to the success of Sandia's most complex weapon system tests. Anthony has shared his knowledge effectively by mentoring less experienced technologists and staff over the years.



ANTHONY GOMEZ

Shekita Robinson

Shekita Robinson is being recognized for technical leadership in supporting stockpile surveillance activities. Shekita has done an outstanding job developing, coordinating, and leading the stockpile support team for the Enhanced Surveillance Campaign within organization 2351, which is responsible for numerous major components in every weapon system in the active stockpile. Her excellence in leadership is evident by her impressive inter-site efforts to determine technical approaches for analyzing and predicting the state of health of many different weapon components. Shekita's customers, including the systems organizations for the B61, B83, and W80 systems, have been delighted with her technical contributions.



SHEKITA ROBINSON

Eight Sandia individuals and 14 teams were honored with National Nuclear Security Administration (NNSA) Defense Programs Awards of Excellence during ceremonies in New Mexico on August 15. Martin (Marty) Schoenbauer, NNSA (NA-10) Acting Principal Assistant Deputy Administrator of Military Application Defense Programs, was guest speaker at the New Mexico event. California recipients

will be honored in a separate ceremony on Sept. 22.

The NNSA Defense Programs Awards of Excellence originated in the early 1980s to give special recognition to those at the laboratories and plants directly associated with the stockpile modernization program. Today the awards honor exceptional contributions to the stewardship and management of the stockpile.

and integration of the Nuclear Weapons Computing Clusters (NWCC), which increased capacity computing resources to support the Nuclear Weapons Strategic Management Unit. The team tirelessly contributed to every aspect of the \$9.8 million contract project, resulting in the successful delivery of NWCC to the nuclear weapons community and a \$1 million savings to the nuclear weapons customer.

Team leader: John Zepper. Team members: Donna Brown, Anthony Chavez, Sophia Corwell, Joshua England, Eric Engquist, Marcus Epperson, David Evenky, Jerrold Friesen, Ronald Green, Darrian Hale, Catherine Houf, Linda Jaramillo, Kevin Kelsey, Jesse Livesay, Christopher Maestas, Geoffrey McGirt, Jeffrey Ogden, Douglas Pannell, Don Rudish, Michael Sanchez, Randall Scott, Jerry Smith

Radar Modeling in Plasma Team

The Radar Modeling in Plasma Team is being recognized for successfully predicting performance of narrowband reentry radars in the presence of high-velocity plasma. The dedicated team developed new first-principles models of electromagnetic propagation and modulation in hot plasma, which are complex models requiring extensive, rigorous theoretical work and simulation time. As the key contribution, the Nuclear Weapons Complex can offer a new radar system to the Navy with a good understanding of its performance, even from a limited series of flight tests.

Team leader: Billy Brock. Team members: Donald Jelinek, William Liou, Donald Potter

Sandia Lean Six/Sigma Black Belts

The Sandia Lean Six/Sigma (LSS) Black Belts are being recognized as dedicated leaders who apply LSS tools and concepts to develop improvement solutions in support of the Nuclear Weapons Program. Throughout 2004, LSS Black Belts supported approximately 50 strategically aligned Nuclear Weapons Program events, including QFE Weapons Component, NNSA Nuclear Explosive Safety Study Process, MC4712 Impact Fuze Mass Property Measurement Improvements, MC4300 Welding Standard Work Cell, W76/W78

Neutron Generator Inspection Time, Motor Pool (maintenance areas of Nuclear Weapons Transporters), and the SNL Calibration Value Stream. Outstanding results include significant improvements in quality of data, productivity, creativity, and cost avoidance.

Team leader: Cindy Longenbaugh. Team members: Georgia Artery, Tamara Deming, Laura Guedelhoefer, Dennis Owens, Elsi Rodriguez, Rick Sherwood

SNL/LLNL Weapons Analysis and DAKOTA Applications Team

The SNL/LLNL Weapons Analysis and DAKOTA Applications Team is being recognized for SNL and LLNL staff collaborations to quantify design margins and performance uncertainty in the nation's nuclear stockpile. With the aid of the Sandia-developed DAKOTA software toolkit, LLNL A-Division staff members now routinely perform thousands of high-fidelity weapon simulations, on a variety of massively parallel computers, to quantify weapon performance margins and uncertainties. This new capability allows comparison of legacy and modern weapons code predictions to underground nuclear test data.

Team leader: Anthony Giunta. Team members: Shannon Brown, Michael Eldred, Scott Mitchell, Martin Pilch, Laura Swiler, Timothy Trucano, David Womble, and, from LLNL, John Bolstad, Scott Brandon, Pieter Dykema, Richard Klein, David Kraybill, James McEnerney

W78 Neutron Generator Probabilistic Qualification Team

The W78 Neutron Generator Probabilistic Qualification Team is being recognized for demonstrating a new probabilistic assessment methodology applied to the W78 neutron generator. Through innovative data mining and visualization of computational information, the dedicated team created a high-performance computing approach for making design



Weapons Analysis and DAKOTA Applications Team

choices that considerably reduced manufacturing cost. The military customer enthusiastically accepted this novel approach, which will yield great future benefit because of design simplification.

Team leader: Brian Franke. Team members: Mark Hedemann, Ronald Kensek, Thomas Laub, Phil Hume (K-Tech)

W80 Life Extension Program Flight Test Team

The W80 Life Extension Program Flight Test Team is being recognized for combined effort with the Air Force to execute environmental flight tests supporting the W80 Life Extension Programs. Between February 2004 and August 2004, the W80-3 LEP flight test team successfully executed a series of captive carry environmental flight tests. The quality of the products delivered to the Air Force base was excellent. During the seven flight tests, all of the instrumentation channels reported with no in-flight failures and the quality of environmental data collected was outstanding.

Team leader: Alfred Ver Berkmoes. Team members: Lorenzo Asia, Derek Baptist, Gerald Belluomini, Luis Bernardez II, Joel Groskopf, Steven Haney, Steven Ikebe, Kevin Lam, James Lauffer, Alvin Leung, Paul Mendes, Eldon Porter, Patrick Tamayo, John Van Scyoc, David Zanini, Heinz Fromm (Boeing, ALCM POC), Chris Odanski (Cruise Missile Product Group, AF POC), Tony Lavietes (LLNL), Mike Ormand (Raytheon, ACM POC), Scott Perkins (LLNL)

W80-3 Abnormal Environment ASC V&V Milestone Team

The W80-3 Abnormal Environment ASC V&V Milestone Team is being recognized for dedication and commitment to excellence in the successful completion of the W80-3 Abnormal Environments ASC V&V Milestone. The team planned, performed, and documented a series of experiments and corresponding analyses to support the W80-3 qualification process. Experiments and analyses were done at increasing levels of complexity. Work was performed in accordance with the ASC verification and validation process. The successful completion of this Level 2 Milestone was instrumental in the "Outstanding" rating that Sandia received from NNSA in FY04.

Team leader: Martin Pilch. Team members: James Aubert, Jose Barela, Amanda Barra, Bennie Belone, Bennie Blackwell, Barry Boughton, Jo Bridge, Johnny Casias, Jr., Raymond Cote, Neil Davie, Daniel Dawson, Jay Dike, Kevin Dowding, Kenneth Erickson, Victor Figueroa, Walter Gill, Sylvia Gomez, Louis Grizzo, Arne Gullerud, Kenneth Gwinn, Charles Hanks, Eugene Hertel, Jr., Daniel Hester, Michael Hobbs, Roy Hogan, Jr., Patricia Hough, Tina Huber, Michael Jew, Joseph Jung, Bruce Kistler, John Korellis, James Koteris, Marvin Larsen, Kenneth Lee, Sangwook Lee, Monica Martinez-Canales, Sam McFadden, James Nakos, John Oelfke, Jakob Ostien, Michael Prairie, Daniel Ramirez, Vicente Romero, Edward Russick, Armando Saenz, Simon Scheffel, Jean Sena, Joe Shelton III, Paul Spence, James Stewart, Gerald Stoker, Amy Sun, Kyle Thompson, Paul Thompson, Steven Trujillo, Vernon Wallace, Sr., Steven Younghouse

W87 Body Section Processing Team

The W87 Body Section Processing Team is being recognized for the successful delivery of reprocessed Mk21 Body Sections, enabling completion of the W87 Life Extension Program (LEP). As the W87 LEP neared completion, Sandia and Pantex determined that the project faced a certain shortfall of Mk21 Body Sections, the aeroshell into which W87 warheads are built, which could jeopardize the deadline imposed by NNSA Headquarters. To complete the W87 LEP on schedule, Sandia developed and executed a rigorous process to recover damaged Body Sections and make them available for use by Pantex.

Team leader: Veronica Harwood. Team members: Christopher Binns, Linda Domeier, Marion Hunter, Patrick Keifer, Robert Oetken, Donald Osbourn, Bernard Pelletier, Lee Rieger, Catherine Schmitz, Lynn Shackelfoot, Dale Walker, Alonza Campbell (BWXT/Pantex), John Cartwright (BWXT/Pantex), Shawn Wagner (BWXT/Pantex)

War Reserve COTS Insertion Process Team

The War Reserve COTS Insertion Process Team is being recognized for developing the War Reserve COTS Insertion Process in support of affordable W76-1 and W80-3 Life Extension Programs. The team developed and implemented standard processes and tools for selecting, assessing reliability, procuring, accepting, qualifying, and performing surveillance of commercial-off-the-shelf (COTS) electronic piece parts. Over a four-year multi-site effort, the team used a life of program buy strategy and concurrent engineering to coordinate and integrate design agency, production agency, and third-party test house requirements.

Team leader: Paul Plunkett. Team members: Joseph Aragon, Christina Benavidez, Steven Biehler, Roger Billau, Joe Borrego, Jimmy Bou, Jeffrey Braithwaite, James Clements, Clarence Collins, Emily Crespin, Lorraine Curtis, John Gaona, Jr., Floyd Gentry, Douglas Greenway, Jr., Emmett Gurule, Terry Hardin, Raymond Heath, Stephen Hwang, John Lopez, Michael Lowinske, Ruth Lucero, Julio Marchiondo, Jr., Jimmie Martinez, John McBrayer, Fredrick McCrory, Kenneth Mehlhaff, Arthur Minser, Matthew Montano, Frank Paulic, John Richter, Catherine Rosul, Charlie Sandoval, Gary Schuster, Neil Sorensen, James Sweet, Paul Vianco, Jerry Villanueva, Richard Wavrik, John White, John Witham. And, from Honeywell/FMT — Dick Bornkessel, Keith Bradford, Roy Brown, David Curtin, Matt Davis, David Draxler, Max Dyck, Greg Enserro, Kurt Gittinger, Steve Halter, Jeff Heller, John Minihan, Randy Monson, Terry Muskopf, Karen Riddle, Jeff Rothen, Ed Schmidt, Pete Speer, Gerald Swanson, Melissa Thompson



W87 Body Section Processing Team



W80 Life Extension Program Flight Test Team

CINT facilities, enhanced by thousand-year-old Chaco culture decorative style, nearing completion

Sandia, Los Alamos joint nanotechnology project encourages collaborations and new designs

By Neal Singer

A two-story-high, 450-foot-long wall surfaced with flat-chipped rock evocative of Chaco Canyon has been erected north of the Kirtland Eubank Gate and west of Eubank Blvd.

The curved, two-foot-thick wall cuts across the three laboratory wings of the new core facility of the Center for Integrated Nanotechnologies.

The wall's function is not structural but to serve as an advertisement rooted in New Mexico's history.

"We're trying to create a working environment that is attractive to the brightest scientists [from everywhere]," says Sandia project manager Bill Hendrick (10824) of the architectural enhancement, as well as other features in the new structure, funded by the DOE Office of Science.

An imitation of the walls of Chaco Canyon structures built nearly a thousand years ago, the curved wall (for reasons of cost, built internally of steel) gives the core building a distinctly different look from other buildings in the technology park to the south.

"We wanted to juxtapose high-tech with what we understood of New Mexico's history: today's cutting edge with yesteryear's," says Bill Wells, senior architectural project manager of Arizona-based HDR, the building's design firm.

That thoughtfulness includes the creation of casual meeting spaces between the three major lab divisions for "scientists, who may not be the most extroverted, to mingle and chat," says Paul O'Donnell, project manager for general contractor Hensel Phelps.

The design, which radiates the three labs west from the curved stone wall façade like spokes from a wheel, includes sophisticated characterization capabilities in the northern-most wing; physical, chemical, and biological synthesis facilities in the middle wing; and clean rooms for nano/micro integration to the

south.

The design, says CINT user program manager Neal Shinn (1131), was arrived at through meetings among Los Alamos and Sandia engineers and scientists, who discarded the idea of a more common rectilinear building for the current structure.

CINT is a joint venture of Sandia and Los Alamos, with the 96,000-square-foot core facility expected to act as headwaters from which work will flow as appropriate to LANL's 35,000-square-foot gateway facility, or to Sandia's gateway facility, housed in Bldg. 897 at the southeast corner of Area 1.

Construction is on schedule at both labs, with the core facility expected to be physically completed by late November and the LANL gateway by mid-January. The latter is a feat in itself, considering that construction proceeded through LANL's administratively ordered shutdown and 38 days of bad weather, says LANL Gateway project manager Ross Garcia.

"We changed strategy to start [raising] steel on footings in parallel with [laying] the slab," rather than laying all the slab and then proceeding to raise steel, he says. "The rain was puddling up."

"It's important the buildings are ready at [roughly] the same time," says Jerry Hands (10800), general technical manager of the project. "Equipment would have to be purchased separately or stored if all buildings weren't ready for them. Buying two or three items [at a time] gets [CINT] quantity discounts."



AN AERIAL PHOTOGRAPH of the new core facility of the Center for Integrated Nanotechnologies. Its 450-foot-long, two-story, curved front wall of flat-chipped rock is designed to evoke the ancient structures of Chaco Canyon.

All equipment should be installed, and all DOE qualifications met, by March, says Jerry.

Sandia and LANL researchers have worked together before and often, but CINT is the first jointly built project. Jerry, who has headed the construction of National Ignition Facility buildings (not the laser itself) at Lawrence Livermore, and other projects at Sandia and LANL, doesn't take the new challenge lightly. He divides his time between the two labs to spot problems early. "If one construction project succeeds and the other fails," he says, "I've failed."

Teams of engineers and scientists from both labs decide jointly on equipment that will populate each facility. Researchers from both labs will work at all CINT Facilities.

CINT is one of five nanotechnology centers funded by DOE's Office of Science. More than 60 nanotechnology research projects are already ongoing at LANL and Sandia, funded by "jumpstart" funds from the Office of Science and scattered through the two giant labs.

MESA's WIF construction, parking lot continue on course

'King for a Day' exercise ('KFAD,' as Sandians speak it) sharpens Weapons Integration Facility's focus

By Neal Singer

The half-billion-dollar MESA project is two-thirds complete, with its final building — the Weapons Integration Facility — "over a third done," says construction project manager Bill Jenkins (12920).

Work is ongoing, with red fire-coated steel girders in place and concrete sections raised and attached, all to the roar of large machines whose bite and lift are controlled by operators manipulating hand controls about the size and shape of chopsticks.

Looking south from Area 1, the linear array of large flat buildings resemble a football team's crouched forward line.

Construction should be complete by summer '06, with a ribbon-cutting scheduled for the MicroFab and MicroLab in spring, and personnel moved in by summer '07, says Deputy Project Manager Bill Kitsos (10823).

The hardest part, says Bill Jenkins, will be the last 10 percent of the job, when inspectors ask contractors to redo installations that do not meet requirements, and Bill's office must deal concurrently with small contractors whose need for immediate payment is great.

A recent construction safety success involved a \$10 million specialty gas contract in the MicroFab



AN AERIAL PHOTO shows MESA's MicroFab and MicroLab, scheduled to be completed by the summer of '06. Personnel will be moved in by summer '07.

that was completed with no accidents, one safety violation, and no DOE reportable occurrences, says Bill. Local construction company Big J earned all but \$250 of its entire \$25,000 safety incentive (money kept in escrow and dispersed in inverse relation to the number of accidents) for its strong performance.

Perhaps of more immediate interest to Sandians, Bill expects parking around Bldg. 897 to

increase by 25 percent this fall when half a lot opens south of luncheon facilities that are themselves south of Bldg. 897. Ultimately, when WIF is complete and the restaurant facility is closed or relocated, plans are to double current parking capacity.

In the second line of buildings further north, the compound semiconductor lab to replace the trailers and aging buildings of the current CSRL facilities east of Wyoming Blvd. is completed. (Sen. Domenici was once shown a toilet that had fallen through the rotting floor of one of the trailers in the old complex to demonstrate the need for new research facilities.) Equipment will soon be moved from the old area to the new.

The new MicroLab, which will house 274 people, is 95 percent complete, with a fall completion date scheduled for the building. It should be fully occupied by next spring.

Says David Plummer (5330), deputy MESA director, "The major inhabitants of MicroLab are going to be Centers 1700 (Microsystems) and 1100 (Physical Sciences) — not much surprise there — but we're also going to take some of the folks doing the interesting Material Science (1800), Engineering Sciences (1500), and Surety Components (2600) at MESA TOP and put them in MicroLab rather than WIF, specifically to get more of the

(Continued on next page)

Jaime Moya to receive Hispanic Engineer National Achievement Award at October conference

By Iris Aboytes

Imagine your first day in kindergarten and you speak no English. Jaime Moya, senior manager of ES&H Planning & Assurance (10330), does not have to imagine it. He lived through it.

"I recall my mother dropping me off, seating me at my desk, and quickly escaping the classroom," says Jaime of that day many years ago. "I then remember hearing all this jabbering going on around me and having no clue what anyone was saying."

Jaime was recently named recipient of a 2005 Award for Professional Achievement from the Hispanic Engineer National Achievement Awards Corporation. The award will be presented at the 2005 HENAAC Conference in October in Anaheim, Calif.

Jaime's love of science first became evident in his chemistry class in high school. He attended a summer program at the University of Oklahoma. "I was extremely excited," says Jaime. "I am sure that my parents were equally excited, but they were also financially burdened."

Jaime's parents are immigrants from Chihuahua, Mexico. His mother, Rosa, came from Santa Eulalia, a mining community. To the south in Chihuahua is the cosmopolitan town of Hidalgo Del Parral, where his father Luis was born. Jaime was raised in El Paso. His father was a high-speed photographer at White Sands Missile Range.

When it was time for Jaime to go to college, it was his grandfather who paid for the first semester. Jaime was awarded numerous scholarships to help offset tuition. He received his bachelor's degree in mechanical engineering from New Mexico State University and came to work at Sandia. Here he was selected to participate in its graduate studies program, so Jaime went to the University of California at Berkeley and earned his master's degree.

Jaime says he got his mechanical skills from his father. One of his recollections of his father's genius is about his family's 1965 Ford Galaxie LTD. "He had no money to repair it or buy special tools," says Jaime. "My dad went to the library and got books on transmissions. He built the tools that he needed — a transmission jack, a sup-

port structure for the transmission, and gear alignment tools. Then he proceeded to fix the car."

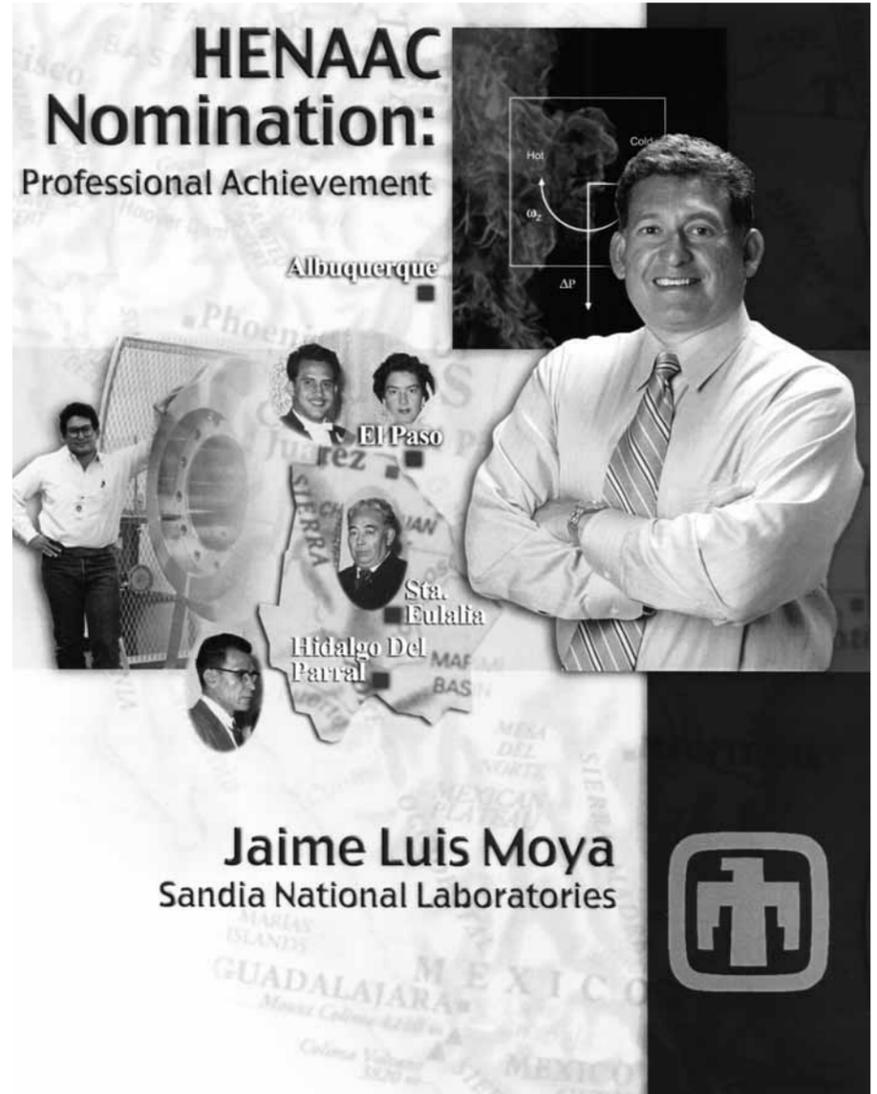
"My mom kind of gave us our souls," says Jaime. "She instilled in my brother, sister, and me the virtue of family and caring for each other."

Jaime and his wife Elizabeth have four children: Monica, Marisa, Daniela, and Jaime. He and his wife work closely with their children to nurture a love for technology, science, and engineering. Both Jaime and Elizabeth are long-time school volunteers and enthusiastic supporters of their children's activities.

At Sandia Jaime personally recruits and encourages Sandia staff to participate in community projects such as university student mentorship programs, local and state science fairs, and the MANOS program. In addition, he chairs Sandia's Hispanic Leadership Outreach Committee.

Jaime is currently responsible for developing and leading a corporate-wide initiative to achieve "Best-in-Class" Environmental Safety and Health (ES&H) within a decade.

"I vividly recall that first day in kindergarten," says Jaime, "seeing my mother peer



JAIMIE MOYA was recently named recipient of a 2005 Award for Professional Achievement from the Hispanic Engineer National Achievement Awards Corporation. The award will be presented at the 2005 HENAAC Conference in October in Anaheim, Calif. Jim Bechdel (3654) designed the nomination booklet cover.

through the window. I can imagine the anxiety racing through her, wondering if I would survive the day. That day prepared me for the rest of my life. It was indeed my first challenge."

MESA's WIF

(Continued from preceding page)

blending we experienced successfully at the experimental facility."

MESA TOP 1 and 2 are, in effect, sociological experiments currently taking place in Sandia's Research Park to gauge the effectiveness and creativity that result from mixing people from different line organizations to form a more interactive workplace.



MESA's Weapons Integration Facility (WIF) is seen under construction in an aerial photo. It is one-third completed.

"Most innovation comes from putting disparate ideas together," says David. "We're putting together people who have reason to interact but haven't, because they work on a campus a mile square. It's a way to keep innovation going."

The arrangement honors Tom Hunter's vision of using science and visualization to change the way engineering is done at Sandia, he says.

Innovative is the right word to describe the novel approach used to determine who will occupy the WIF. Center program director Mike Cieslak says that senior managers were each encouraged to be king for a day ("KFAD," he jokes), instead of each being an advocate for their center.

"They got to be Mike Cieslak, Don Cook (former MESA program director), or David Plummer for a day, and ask what the mission is and how to solve it," says David. "Then we combined and distilled all those disparate inputs to arrive at these areas we're going to have."

The main themes of WIF are expected to be microsystems-enabled guidance system fuzing, future weapon architectures, and wireless systems.

Feedback

Q: I am rather concerned after attending several department, center, and division meetings about the strong emphasis on reducing the number of work-related injuries, especially slips, trips, and falls. I fully support all ES&H initiatives to reduce or eliminate . . . injuries, but the message was we MUST lower the number to zero. I fear that this message may be interpreted by people to NOT report slips, trips, and falls, thereby keeping the numbers of reported injuries low. How can we prevent this from happening? I think the emphasis must be that we care about the people that work here and want to keep them safe. If they should slip or trip, we want them to report it and make sure they are examined. By reporting incidents it also has the potential of protecting others if an unsafe condition exists.

If a person is injured at work, the injury itself is enough of a painful reminder to stay safe. The injured person doesn't need an additional reprimand. We should never fear reporting an injury, incident, or occurrence.

A: The intent is not to invoke a culture that fosters nonreporting of accidents and injuries. Reporting is the right, ethical thing to do. We intend to raise the awareness of all members of the workforce and to illustrate that management is committed to providing a safe work environment. We report the number of incidents as a mechanism to heighten awareness of the workforce about the issues associated with slips, trips, and falls. We also have provided advice to empower employees to prevent risk behaviors that could lead to slipping, tripping, and falling as recently reported in *Lab News* articles.

— Kathleen McCaughey (6300)

Mileposts

New Mexico photos by Michelle Fleming
California photos by Bud Pellittier



Paul Gabaldon 30 12332 Luis Martinez 30 4336



Gerald Roudabush 30 10848 B. Lee Hall 30 6955
Michael Lucero 30 10848 Norberto Garcia 30 10842



Peter Manley 30 2564



Douglas Abrams 25 2433



Terry Calloway 25 5937



Pamela Mincey 25 10864



Danny Rey 25 2565



Michael Rocco 25 10848



Moss Tallant 25 10864



Frank Vigil 25 2994

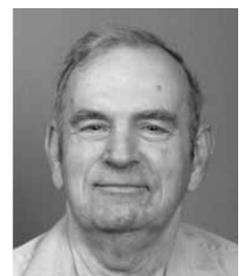


Roger Hartman 15 6956



William Replogle 15 8154

Recent Retiree



Raymond Josephson 25 9615

Interns gained real-world experience at the annual Student Symposium

Many presented research they conducted over the summer

By Erin Gardner and Elizabeth Malone

Students wrapped up the summer Aug. 2 by presenting their work as Sandia interns at the annual Student Internship Programs (SIP) Symposium.

SIP holds the symposium to offer the real-world experience of turning research into a presentation format, completing the review and approval process, and showing managers and peers a finished product.

"It's nice to be able to show others what I do and to look back and see what I've done in the past few months," says year-round intern Anthony Gonzalez (3555).

Held at the Albuquerque Convention Center, the annual symposium is a voluntary, non-competitive event, although managers can require students to participate, says Roberta Rivera (3555), SIP project lead and symposium coordinator. Students ask scientists and other professionals to provide feedback on their presentation skills and technical merit.

Of the 800 attendees from around the country, 214 student interns ranging from high school to graduate school gave oral or poster presentations. Whether they presented or came to observe, students called the symposium fun, educational, and rewarding.

"My presentation on nanolithography relates back to my thesis work," says Teresa Clement (1114) from Arizona State University. "I also see things here in my technical area that I don't get to see every day. I wouldn't get to see this research otherwise."

Five Lockheed Martin interns from around the country were also selected to present at the symposium.

Throughout their preparation, mentors and other employees provided resources and guidance to students. In Dept. 5526, manager Bill Richard and mentor Gary Cable worked throughout the summer with their graduate intern from Texas Tech, Lauren Ferguson, to pre-

pare for the symposium.

"The mentorship worked both ways," said Gary. "It wasn't just me going to her office with questions or her coming to mine all the time."

Gary and Bill attended Lauren's presentation on post-processors, the optical signals produced by an explosion, and praised her poise and technical achievement. Lauren enjoyed the mentorship and the practice of public speaking and listening to others.

"It's always good practice for me to talk in front of people and know generally how to give presentations," she said. "There's a lot of variety in what presentations were available, and I like to see what other people in the Labs are doing." For example, one project that caught her eye explored relations between India and Pakistan.

Josh Reich and Jason Trent (both 5616), who spoke jointly on Malware Signature Paradigms, say they enjoyed the experience of getting to know other organizations. Kelly Snow (12903), winner of a symposium Amigo award for her outstanding work with Microsystems and Engineering Sciences Applications (MESA) interns, agreed that the review and approval, public speaking, and social aspects prove valuable to students during and after their time at Sandia.

"The symposium makes them put their thoughts on paper as to what they did this summer and create a project that they will probably take back to school," says Kelly, who guided 50 graduate and postdoctoral students through the MESA program and about 20 of those through the symposium. "Working with these students is the best experience ever," she added. "They're absolutely brilliant - they don't know it can't be done, so they do it."

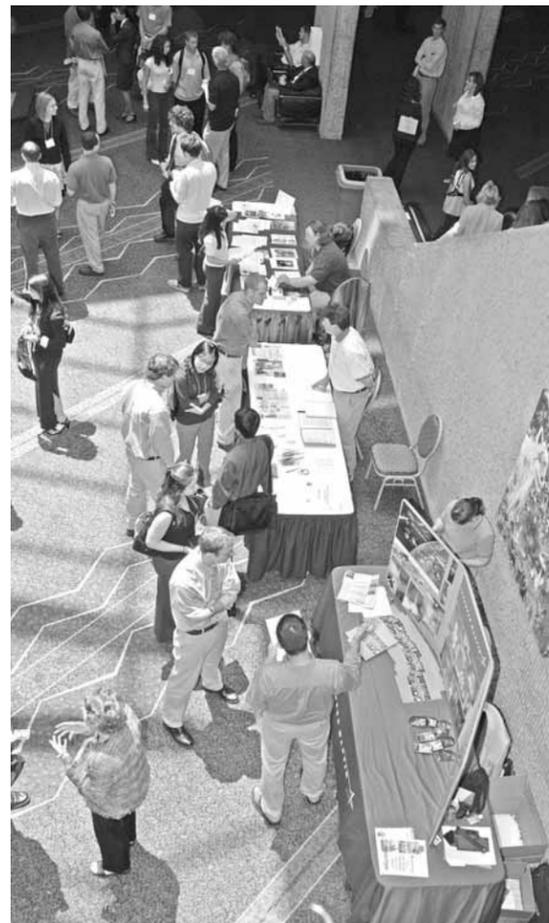
Other activities during the event included a luncheon, a graduate opportunities panel where Labs President Tom Hunter spoke about his educational background, and an evening reception. A career fair also offered fellowship opportunities, graduate school recruitment, and employment opportunities from Lockheed Martin.

James Powell, executive director of the National Physical Sciences Consortium, served on the panel and manned a booth in the career fair.

"The symposium is very good experience for students," he says. "It turns them into scientists instead of just people reading about science. Science is about the transmission of knowledge, and you have to tell others of your developments."

Powell provided information about the consortium's fellowships sponsored by Sandia for students pursuing a PhD in science or engineering.

Says Powell, "These students are doing the best possible thing in order to receive a fellowship like ours: research."

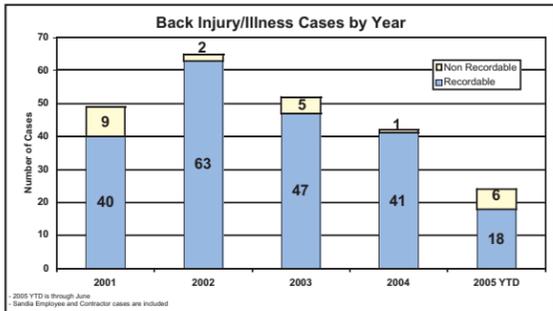


STUDENT INTERNS network with Lockheed Martin and college recruiters at the annual SIP symposium. (Photo by Bill Doty)

Bits and pieces 'bout backs

By Iris Aboytes

The graph below shows the number of back injuries at Sandia over the last five years. We asked Jennifer Kofoed, exercise physiologist for the HBE Employee Health Program (3331-2), some questions on backs and thought you might be interested in the answers.



1. People experience many back injuries during lifting. Why?

Practicing proper lifting techniques and making sure you have a strong core (trunk) are both key factors in preventing back injuries. Preventive health offers two back classes that cover proper lifting techniques, and we also have certified fitness professionals to prescribe an exercise program for strengthening the core.

2. When lifting heavy objects or bending over, what part do quadriceps play?

The quadriceps are one of the strongest and largest muscle groups. The muscles are located in the upper front thigh and are responsible for hip flexion and knee extension.

Since the muscles in the lower back are very small, they are subject to strains when overexerted. Having strong quadriceps helps us lift properly and take the stress off our backs. Without using our legs to lift, the discs in the lower back bear the heaviest load and the lower back becomes the pivot point when we bend to lift, or twist during a lift.

3. Often when bending or squatting, knees begin to identify themselves by their audible creaking noises. Is that a sign of injury?

Popping and snapping within the knee is quite common, and often not a symptom of any particular problem. When the pops or snaps are painless, there is usually no problem. However, there is concern when these sounds are associated with pain.

Proper lifting techniques usually don't involve a full squat, so you should not have any knee or back problems if you are using the correct technique. When lifting heavy objects the best angle for your knees is 45 to 60 degrees of flexion. Think about sports such as weight-lifting, football, and basketball. They hardly ever are in a full squat because you don't have as much power from that position.

4. Most pieces of machinery work as long as they are oiled and each part is properly cared for. The human body being the greatest machine of all, how can we keep our backs in good working order?

Several things can be done. First, exercise the back. Perform stretching and strengthening exercises at least three times a week. Also, try to change positions every 30 minutes. Static posture contributes to body stiffness, pooling of blood in the extremities, and reduced blood flow. Reduced

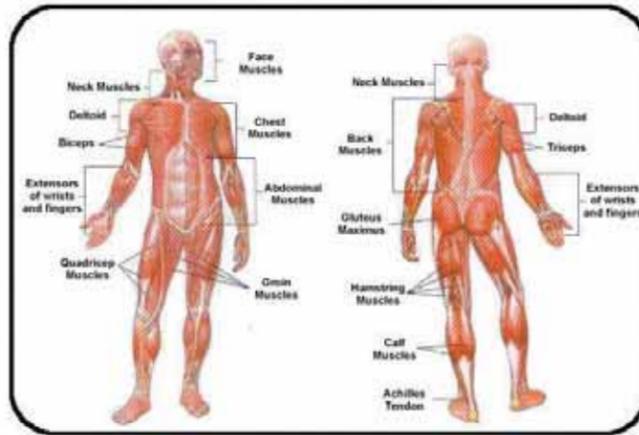
If you have any questions about backs, or want to take classes on trying to avoid back injury, call 844-HBES (4237) or go to <http://www.sandia.gov/health/update/index.html>.

blood flow to tissues results in less than optimal tissue function and increased risk of injury.

In addition, lifestyle choices affect our back. These include weight, nutrition, stress management, and smoking.

5. Muscles can be built up, but they can also break down. Can anything be done to build up or strengthen backs?

Muscles can atrophy (break down) if they aren't used. The muscles in the back can be strengthened by performing exercises for both the upper and lower back. A strong back will help improve posture, work endurance, and athletic performance. One of our fitness specialists can prescribe an exercise program for strengthening the back. Carefully follow the



instructions and do only those exercises that have been recommended to you.

6. Some people complain about back pain when stressed. Can stress cause back pain?

When stress and pressures persist, knots of tension form in select spots along our spines: between the shoulder blades, the back of the neck, and in the lower spine. Sustained stress causes constant contraction of muscles and reduces blood flow. As a result, less nourishment and oxygen reach the muscles and surrounding tissue, and muscles can even spasm. Tense muscles from stress can pull unevenly on bony structures and may eventually pull them out of alignment. A small misalignment can be the beginning of worse problems to come — blocked nerve transmission and impingement.



This monthly column highlights Sandia Lab News items from 50, 40, 30, 20, and 10 years ago, but each column does not necessarily include items from each decade.

50 years ago . . . Sandians and their work at the Salton Sea Test Range were featured in the Sept. 9, 1955, *Lab News*, following a tour of the range the previous week by several newspaper reporters. Established in 1946 about 110 miles east of San Diego, Calif., the range was first used for ballistic and fuzing/firing system tests for the first atomic weapons. At the time of this article, about 100 Sandians were stationed full-time at Salton Sea, conducting various weapon field tests for the Atomic Energy Commission (AEC); the Air Force used the range at other times for "target practice." Several years later, various factors, including the increasing population of the neighboring Imperial Valley, caused Sandia to look elsewhere for a better location, and most test operations were moved to the Tonopah (Nev.) Test Range. The Sept. 23 *Lab News* announced dormitory room vacancies for



Electric cine-theodolite tracking instruments manned by Sandia Corporation employees in 1955 at Salton Sea Test Range, Sandia's field test base in southern California, where models of special weapons were field tested. Left is Carl Hildebrandt, and right, Dewey Stout.

AEC and Sandia employees on Kirtland Base. Private rooms with bath were \$50 a month, linen and maid service included. Dorm residents were eligible for various base privileges.

30 years ago . . . A group photo of 25 new Sandians who had just started four- and five-year technician apprenticeship programs appeared on the front page of the Sept. 19, 1975, issue. The 25 were selected from more than 800 applicants. One of the 25, Willie Vonderheide (now 5997-1), recently had the idea to gather as many of the original folks as possible for new photo; see the photo below of the eight folks who made it for



THIRTY YEARS LATER — Twenty-five new Sandians (top photo) started four- and five-year technician apprenticeship programs in 1975. Thirty years later, eight of the original 25 gathered for a reunion photo. They are, from left, Willie Vonderheide, Clint Atwood, Judy Loving, Theda Jean Williams, Bill Morgan, Peter Manley, John Lanoue, and Andy Brito.

Randy Montoya's recent re-shoot. Inflation was hitting Sandia in many ways, according to the same 1975 issue, including office supplies. A short story said "stenopads" were up to 50 cents each from 35 cents the year before. A box of 100 thumbtacks had gone from 12 cents to 17 cents, and typewriter ribbons from 50 cents to 73 cents. But the story said the most "startling statistic" was that file folders were up a whopping 619 percent, from 1.3 cents to 9.7 cents. "Use those old folders over and over again!" the story advised.

— Larry Perrine

[Safety First]

Wrestling with my workstation is a pain in the neck.

- A poorly designed workstation can lead to health problems
- Set up an ergonomics consultation (tell your manager it's free!)

<http://ergo.sandia.gov>

Brought to you by the Sandia Management Team